IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	Attorney Docket No.: **MIYOSH0008**
	)	
Seiichi AKAGI et al.	)	Confirmation No.: 6701
	)	
Serial No.: 10/598,515	)	Group Art Unit: 1796
	)	
Filed: September 1, 2006	)	Examiner: Hannah J. PAK
	)	
For: SEALANT EPOXY-RESIN MOLDING MATERIAL, AND ELECTRONIC COMPONENT DEVICE	)	

DECLARATION UNDER 37 C.F.R. § 1.132

MAIL STOP: AMENDMENT
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Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

1. I, Seiichi AKAGI, state that I am an expert in the field of the above-captioned application as evident from my Curriculum Vitae, a copy of which is attached herewith as "Exhibit AA," and as evident from the fact that I am a co-inventor of the subject matter of the above-captioned U.S. Patent application.

2. I have reviewed the above captioned application and claims. A copy of the presently pending claims are attached herewith as an Appendix. I have also reviewed the Office Action mailed March 30, 2009, and the Office Action mailed August 21, 2009 in the above-captioned application. I am also familiar with the subject matter disclosed by JP 05-283560 (hereafter, the "Nakamura Document") because I have reviewed this document. In this declaration, I submit my expert opinion regarding the following: (i) the scope of subject matter disclosed by the Nakamura Document; and (ii) the fact that the compound disclosed by Formula 9 of the

Nakamura Document pertains to a completely different class of compounds, namely anthracene epoxy resin, than those recited by General Formula (I) of claim 1 of the above-captioned application, which pertains to a dihydroanthracene epoxy resin; and (iii) the fact that the Nakamura Document does not teach, or suggest, a compound according to General Formula (I) of claim 1 of the above-captioned application.

3. In rendering my opinion I have considered (a) the contents of the specification and claims of the above-captioned application (as amended by Amendment (D), filed herewith, wherein a copy of the amended claims is reproduced below in the attached Appendix), (b) the contents of the Nakamura Document, of record, (c) the contents of the Office Action dated March 30, 2009, of record, (d) the contents of the Office Action dated August 21, 2009, of record, (e) the contents of English Machine translation of the Nakamura Document, downloaded from Japanese Patent Office database on August 5, 2008, of record as "Exhibit A," (f) the contents of http://stneasy-japan.cas.org/tmp/20031110/174338-1056700614-300/409740480.html, downloaded on November 11, 2003, of record as "Exhibit B," (g) a copy of STN Tokyo database search results, three pages, of record as "Exhibit C," (h) a copy of page 85 of HAWLEY'S CONDENSED CHEMICAL DICTIONARY (1987), which is of record as "Exhibit A2," and (i) a copy of U.S. Patent Application Publication No. US 2009/0200071 A1, a copy of which is filed herewith as "Exhibit AB." These are sources of information an expert in my field would reasonably rely upon in rendering an opinion regarding the subject matter of this declaration.

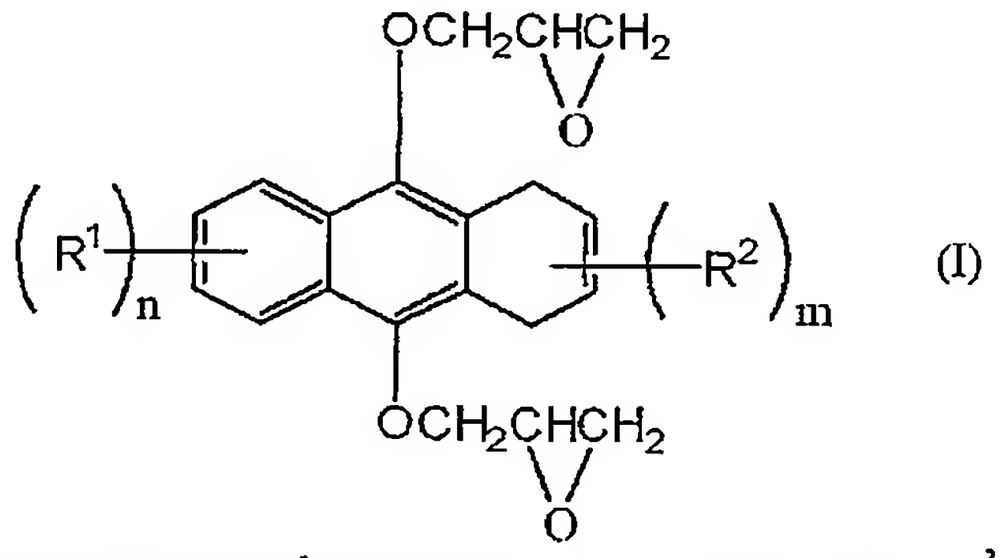
4. Based on my own knowledge and experience in the art, and my review of the materials referenced above, it is my opinion that the Nakamura Patent discloses a compound in Formula 9 known by the chemical name 2,2'-[9,10-anthracenediylbis(oxymethylene)]bis-oxirane,

which is a substantially different compound from that of General Formula (I) of independent claim 1 of the above-captioned application. The basis for my opinion are fully explained below.

The Invention

5. The invention of the above-captioned application pertains broadly to a sealant epoxy-resin molding material, such as may be used to seal electronic component devices. In accordance with an embodiment of the present invention, a sealant epoxy-resin molding material is provided that has features recited by independent claim 1. In accordance with another embodiment of the present invention, a sealant epoxy-resin molding material is provided that has features recited by independent claim 27. Various other embodiments, in accordance with the present invention, are recited by the dependent claims.

6. A sealant epoxy-resin molding material, in accordance with independent claims 1 and 27 of the above-captioned application, comprises an epoxy resin (A) that contains a compound represented by the following General Formula (I):

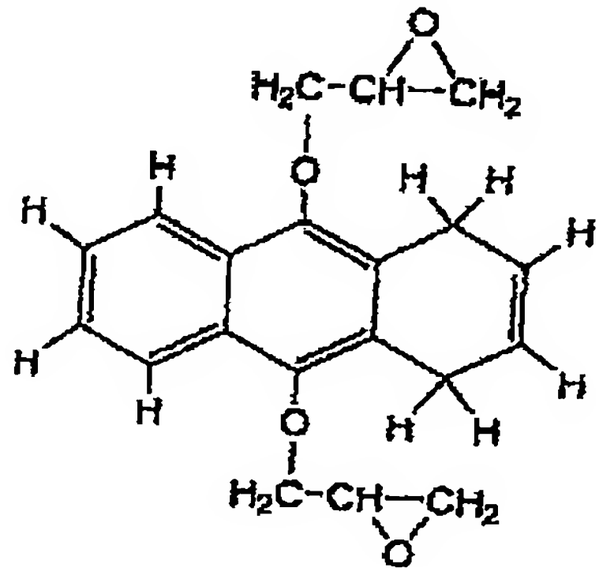


(I)

wherein in General Formula (I), R^1 represents a group selected from substituted or unsubstituted hydrocarbon groups having 1 to 12 carbon atoms and substituted or unsubstituted alkoxyl groups having 1 to 12 carbon atoms, and the groups R^1 may be the

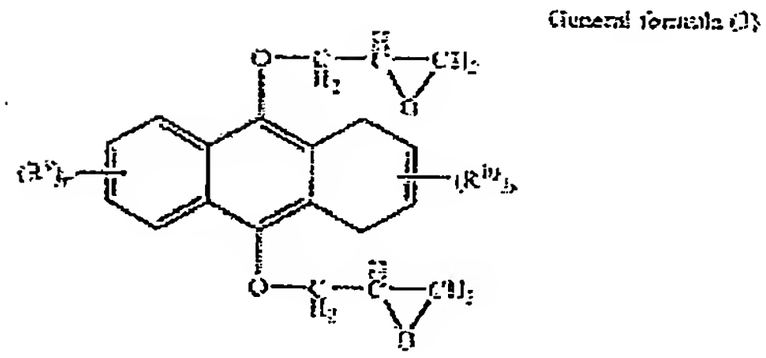
same as, or different from, each other; n is an integer of 0 to 4; R^2 represents a group selected from substituted or unsubstituted hydrocarbon groups having 1 to 12 carbon atoms and substituted or unsubstituted alkoxy groups having 1 to 12 carbon atoms, and the groups R^2 may be the same as, or different from, each other; and m is an integer of 0 to 6.

7. As evident from General Formula (I), when m = n = 0, the compound of General Formula (I) has the following chemical formula:



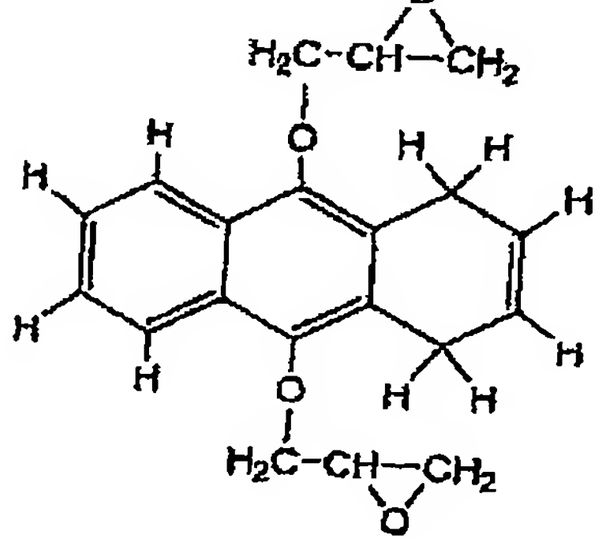
I believe that a person of ordinary skill in the art would instantly realize that the compound of General Formula (I), where m = n = 0, corresponds to CAS Registry Number: 848667-77-6, as evident from the STN Tokyo database search results of record as "Exhibit C," and has the chemical name of 1,4-dihydro-9,10-anthracenediol, and is a polymer with (chloromethyl) oxirane. The compound of General Formula (I), where m = n = 0, is a three ring structure, and a person of ordinary skill in the art would instantly appreciate that the third ring is dihydrogenated.

8. The compound corresponding to General Formula (I) of the above-captioned application is similar to the compound of General Formula (3) of Exhibit AB. General Formula (3) of Exhibit AB is reproduced below,



wherein r is an integer of 0 to 4 and s is an integer of 0 to 6 (Exhibit AB, ¶¶ [0015] and [0016]).

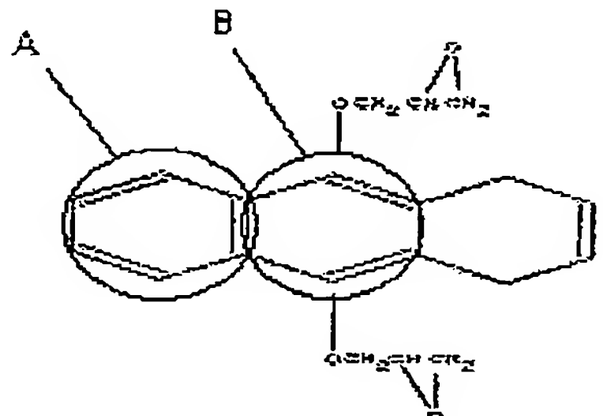
When r = s = 0, General Formula (3) of Exhibit AB corresponds to



which corresponds to General Formula (I) of the above-captioned application when m = n = 0. This compound, according to Exhibit AB, is characterized as a "dihydroanthacene epoxy resin" (Exhibit AB, ¶ [0015]).

9. In my opinion, a person of ordinary skill in the art would instantly realize that the compound of General Formula (3) of Exhibit AB, when r = s = 0, is the same compound as that of General Formula (I) of the above-captioned application when m = n = 0. Therefore, a person of ordinary skill in the art would instantly realize that a compound of General Formula (I) is properly characterized as a dihydroanthracene epoxy resin and not as, for example, an anthracene epoxy resin.

10. As shown below, a dihydroanthracene epoxy resin according to General Formula (I) of the present invention, when m = n = 0, is a three ring structure; however, because the third ring is dihydrogenated, dihydroanthracene epoxy resin has only two aromatic rings, A and B.



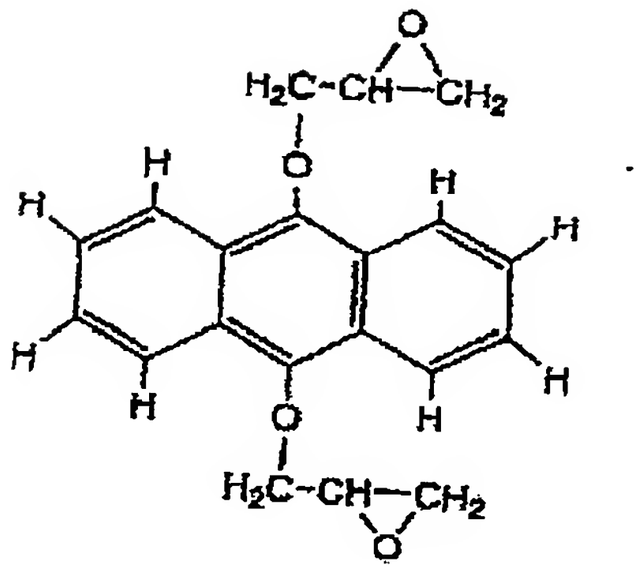
General Formula (I), m = n = 0

The Nakamura Document

11. The Nakamura Document discloses an epoxy resin composition for semiconductor closure, wherein 9,10-dihydroxyanthracene is reacted with epichlorohydrin to produce a compound having the structural formula shown in Formula 9 shown below (Nakamura Document, ¶¶ [0001] and [0044], see also Exhibit A, of record). I believe that a person of

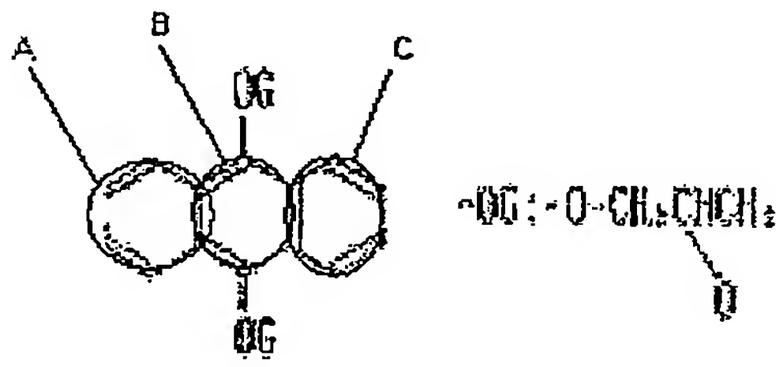
[Formula 9]

ordinary skill in the art would instantly realize that the compound of Formula 9 corresponds to CAS Registry Number: 155665-67-1 (See, e.g., http://stneasy-japan.cas.org/tmp/20031110/174338-1056700614-300/409740480.html, downloaded on November 11, 2003, of record as "Exhibit B"), and has the chemical name 2,2'-[9,10-anthracenediylbis(oxymethylene)]bis-oxirane, and the following chemical structure:



I believe a person of ordinary skill in the art would instantly realize that the compound disclosed by the Nakamura Document as "Formula 9" is an anthracene compound that has three conjugated rings.

12. As evident from Formula 9 of the Nakamura Document, an anthracene compound has three aromatic rings, A, B and C.

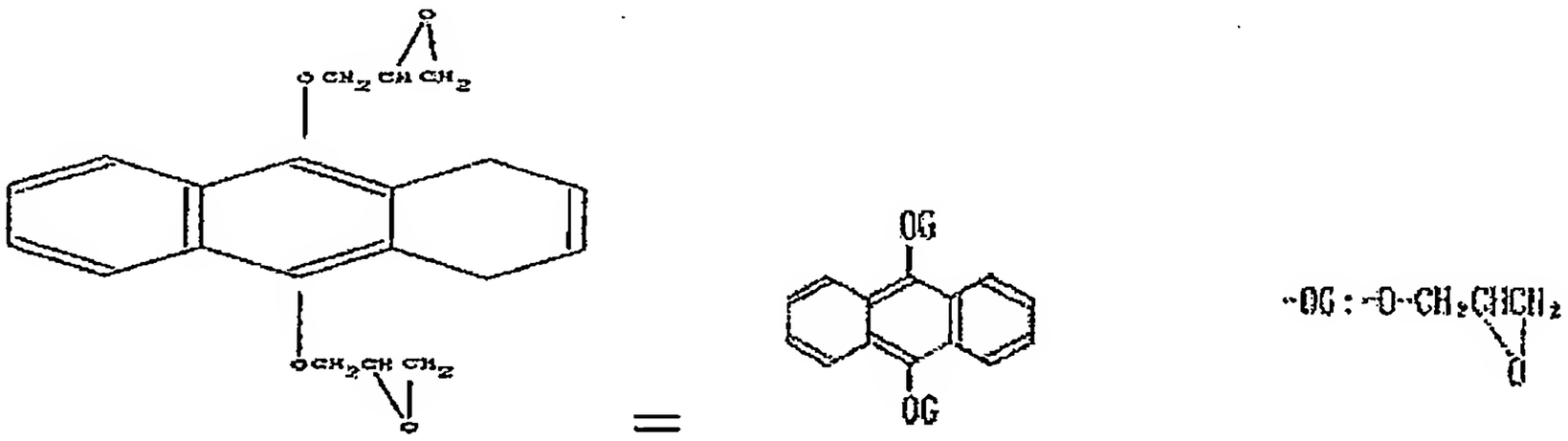


[Formula 9].

Based on the above facts, I believe a person of ordinary skill in the art would immediately realize that an anthracene compound, having three aromatic rings, as disclosed by Formula 9 of the Nakamura Document, is a substantially different compound from the dihydrogenated anthracene compound according to Formula (I) of the above-captioned application.

Comparison of General Formula (I) and Formula 9

13. I understand that the Examiner has mistranscribed the compound of Formula 9 of the Nakamura Document into the Office Action mailed March 30, 2009, at 4, and in the Office Action mailed August 21, 2009, at 18. The Examiner erroneously contends that



I believe that a person of ordinary skill in the art would immediately see that the Examiner's contention is absolutely false because the compound on the left (Examiner's drawing) is a dihydrogenated or reduced anthracene compound and the compound on the right (Formula 9 of the Nakamura Document) is an anthracene compound.

14. Exhibit A2, of record, is page 85 of HAWLEY'S CONDENSED CHEMICAL DICTIONARY (1987), and demonstrates the structural formula of anthracene. This structural formula is reproduced below. As evident from the chemical formula provided on page 85 of HAWLEY'S CONDENSED CHEMICAL DICTIONARY (1987), anthracene has three aromatic rings.

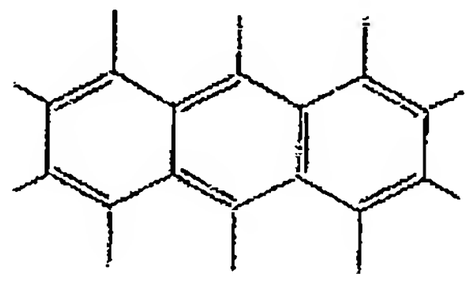
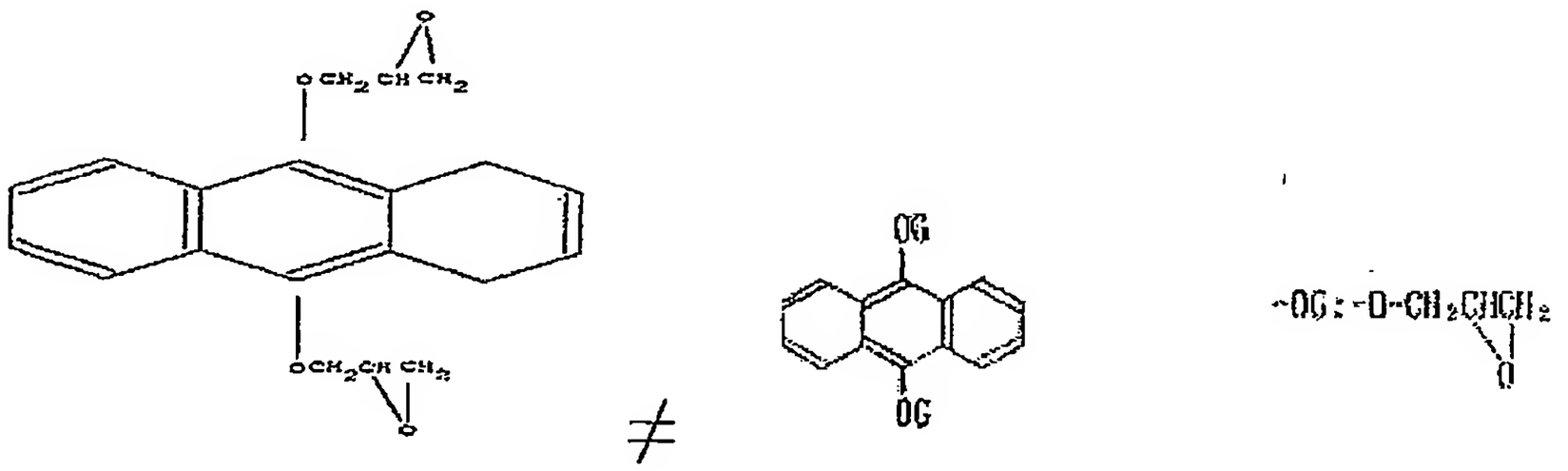


Figure from Page 85 HAWLEY'S CONDENSED CHEMICAL DICTIONARY (1987)

15. In my opinion, a person of ordinary skill in the art would immediately realize that



because the compound of Formula 9 of the Nakamura Document is an **anthracene** compound and the compound written on the top portion of page 4 of the March 30, 2009 Office Action is a **dihydrogenated or reduced anthracene** compound. The compound drawn on page 4 of the March 30, 2009 Office Action is a compound in accordance with General Formula (I) of claim 1 of the above-captioned application when m = n = 0. So, in my opinion, the Examiner has clearly demonstrated that a compound described by General Formula (I), in accordance with claims 1 and 27 of the above-captioned application, is structurally a substantially different compound from the anthracene compound of Formula 9 of the Nakamura Document.

16. For all of the above reasons, I conclude that a person of ordinary skill in the art would instantly realize that the epoxy resin compound employed by the present invention, as recited by independent claims 1 and 27, is a dihydrogenated or reduced anthracene compound, which is a substantially different compound from the anthracene compound of Nakamura's "Formula 9." This fact is also supported by the fact that the Chemical Abstracts Society's (CAS) separately catalogues these compounds. I further believe that it is incorrect to characterize the epoxy resin of Formula (I) of the above-captioned application as an

"anthracene compound" because it is, in fact, a "dihydroanthracene epoxy compound" (See, e.g., Exhibit AB, ¶¶ [0015] and [0016]).

Experimental Data

17. In this declaration, I submit experimental data demonstrating that the subject matter of the presently claimed invention is substantially different from that disclosed by the Nakamura Document.

18. The following experimental data was collected either by me, or under my direction, and demonstrates that an anthracene compound, according to Formula 9 of the Nakamura Document, is a substantially different compound than that of the dihydroanthracene type epoxy resin (i.e., General Formula (I)) recited by claim 1 of the above-captioned application, and, therefore, produces a substantially different (inferior) sealant epoxy-resin molding material than does the dihydroanthracene type epoxy resin of the present invention.

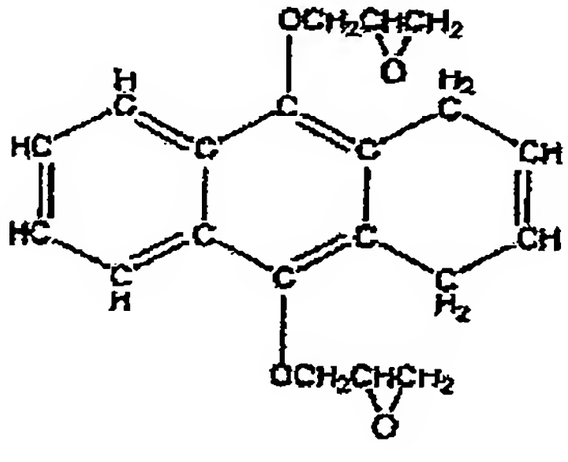
19. Sealant epoxy-resin molding material was made using the procedure outlined in ¶¶ [0164] to [0169] of the original specification of the above-captioned application. In particular, dihydroanthracene epoxy resin in accordance with Example 3 of the above-captioned application was used to make sealing epoxy-resin molding material in accordance with claim 1 of the present invention. A comparative "sealant epoxy-resin molding material" was made using the procedure outlined in ¶¶ [0164] to [0169] of the original specification of the above-captioned application, except that an anthracene epoxy resin, as described in Nakamura Document, was used. The components used to make each one of the two sealant epoxy-resin molding materials are tabulated in Table I below.

Table I

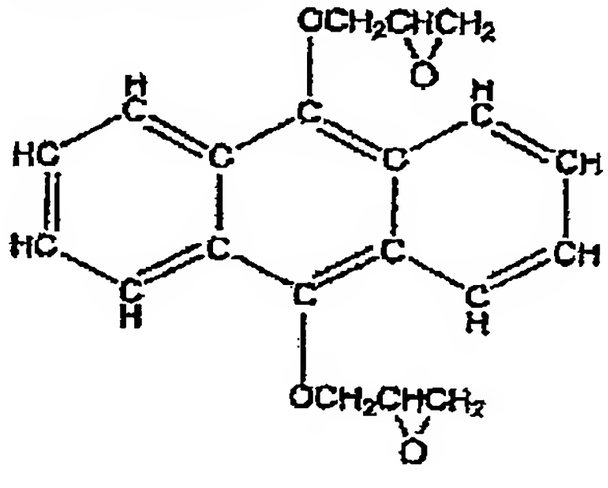
Experiment		1 Example 3 (the invention)	2 Comparative Example
Component (mass)	Epoxy resin 1	100	--
	Epoxy resin 2	--	100
	Hardening agent	97	95
	Hardening Accelerator	2.0	2.0
	Coupling agent	1.0	1.0
	Release agent	2.0	2.0
	Colorant	2.5	2.5
	Inorganic filler	1155 (85 wt %)	1142 (85 wt%)

20. According to Table I above, the Epoxy resin 1 is a dihydroanthracene type epoxy resin (i.e., an epoxy resin of the present invention), and Epoxy resin 2 is an anthracene type epoxy resin (i.e., an epoxy resin as described in the Nakamura Document). In particular, the chemical formulas of Epoxy resin 1 and Epoxy resin 2 are shown below.

Epoxy resin 1



Epoxy resin 2



21. The hardening agent of Table I is phenol-aralkyl resin. The hardening accelerator of Table I is triphenyl phosphine. The coupling agent of Table I is γ-glycidoxypropyltrimethoxysilane. The release agent of Table I is carnauba wax. The colorant of Table I is carbon black. The inorganic filler of Table I is spherical fused silica having an average diameter of 14.5 μm and a specific surface area of 2.8 m^2/g.

22. The sealant epoxy-resin molding material of Example 3 and the Comparative Example were tested for flame resistance (sec), spiral flow (cm), hardness when hot (ShoreD), molding shrinkage (%), gold-wire flow (%), and warping (mm) in accordance with the tests described in ¶¶ [0176] to [0178] of the above-captioned application. The glass transition temperature Tg (°C) was determined for each of the sealant epoxy-resin molding materials using a standard method known in the art. The results of the tests are compiled in Table II below.

Table II

Results		1 Example 3 (the invention)	2 Comparative Example
Evaluation	Flame Resistance: (a) Total flame remaining time (sec)	7	8
	Flame Resistance: (b) Judgment	V-0	V-0
	Spiral flow (cm)	130	89
	Hardness when hot (ShoreD)	72	73
	Glass transition temperature Tg (°C)	130	115
	Molding shrinkage (%)	0.3	0.5
	Gold-wire flow (%)	1.5	1.9
	Warping (mm)	0.3	0.6

Discussion of Results

23. Based on my experience and knowledge in the art, I conclude that a person of ordinary skill in the art would realize that, based on the data tabulated in Table II, a sealant epoxy-resin molding material made using dihydroanthracene epoxy resin (i.e., epoxy resin 1 of Example 3) exhibits substantially superior spiral flow, gold-wire flow, resistance to molding shrinkage, and warping properties over a sealant epoxy-resin molding material made using anthracene epoxy resin (i.e., epoxy resin 2 of the Comparative Example). The substantial improvement exhibited by the sealant epoxy-resin molding material of the present invention was especially pronounced with respect to spiral flow and warping properties.

24. A person of ordinary skill in the art would know that spiral flow and Gold-wire flow are tests relating to the flowability of a material and that resistance to molding-shrinkage and warping are tests relating to the moldability of a material. Thus, the test data compiled in Table II above shows that a sealant epoxy-resin molding material made using dihydroanthracene epoxy resin (i.e., epoxy resin 1 of Example 3) exhibits substantially superior flowability and moldability characteristics over a sealant epoxy-resin molding material made using anthracene epoxy resin. This substantially improved flowability and moldability exhibited by sealant epoxy-resin molding material made using dihydroanthracene epoxy resin over sealant epoxy-resin molding material made using anthracene epoxy resin is unexpected, and could not be predicted, in my opinion, based on prior art teachings.

25. Thus, in my opinion, not only does the Nakamura Document fail to teach, or suggest, dihydroanthracene type epoxy resin, such as is employed by the presently claimed invention, as a component of sealant epoxy-resin molding material, but when anthracene type epoxy resin disclosed by the Nakamura Document is used as a component of sealant epoxy-resin molding material the result is a sealant epoxy-resin molding material that has substantially inferior moldability characteristics compared to sealant epoxy-resin molding material made in accordance with claim 1 of the above-captioned application.

Summary

26. It is my opinion, based on the materials and evidence I have considered, that:

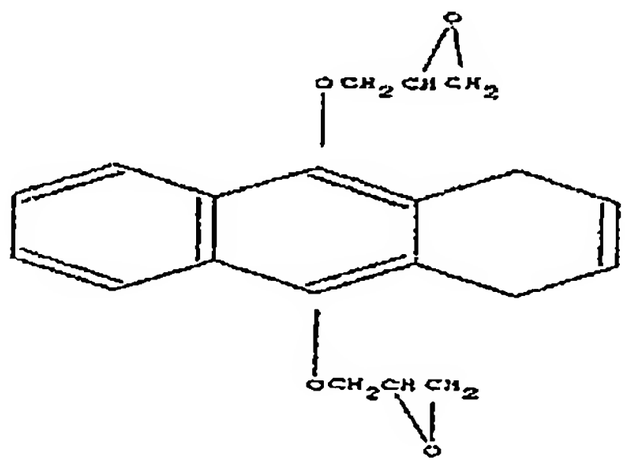
a. the compound of Formula 9 of the Nakamura Document pertains to an anthracene epoxy resin compound;

b. the compound of General Formula (I), as recited in independent claims 1 and 27 of the above-captioned patent application, is a dihydrogenated or reduced anthracene compound and may be properly characterized as a "dihydroanthracene epoxy resin" compound;

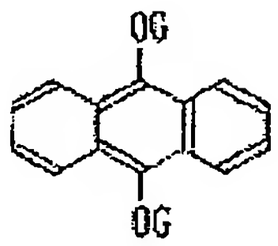
c. the compound of Formula 9 of the Nakamura Document and the compound of General Formula (I) recited by claim 1 of the above-captioned application are substantially different compounds and are expected to have substantially different chemistries; and

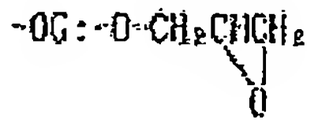
d. the compound of General Formula (I) recited by claims 1 and 27 of the above-captioned application is not an "anthracene epoxy resin" compound because it contains only two aromatic rings and does not have the three aromatic rings that define anthracene;

e. based on my review of the Office Action, mailed March 30, 2009, and on my review of the Office Action, mailed August 21, 2009, I conclude that the Examiner misrepresents the structural formula of Formula 9 of the Nakamura Document on page 3, line 17, to page 4, line 1, of the March 30th, 2009 Office Action, and on page 18, lines 8-15, of the August 21st, 2009 Office Action because



depicts a dihydroanthracene epoxy resin compound and does not correspond to





disclosed by the Nakamura Document, which pertains to an anthracene epoxy resin compound; and

f. the test data compiled in Table II above shows that a sealant epoxy-resin molding material made using dihydroanthracene epoxy resin (i.e., epoxy resin 1 of Example 3) exhibits substantially superior flowability and moldability characteristics over a sealant epoxy-resin molding material made using an anthracene epoxy resin (i.e., an epoxy resin in accordance with Formula 9 of the Nakamura Document), which is an unexpected result, and which demonstrates that dihydroanthracene epoxy resin is a substantially different compound from anthracene epoxy resin.

27. I declare under penalty of perjury that the foregoing is true and correct, that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed by,

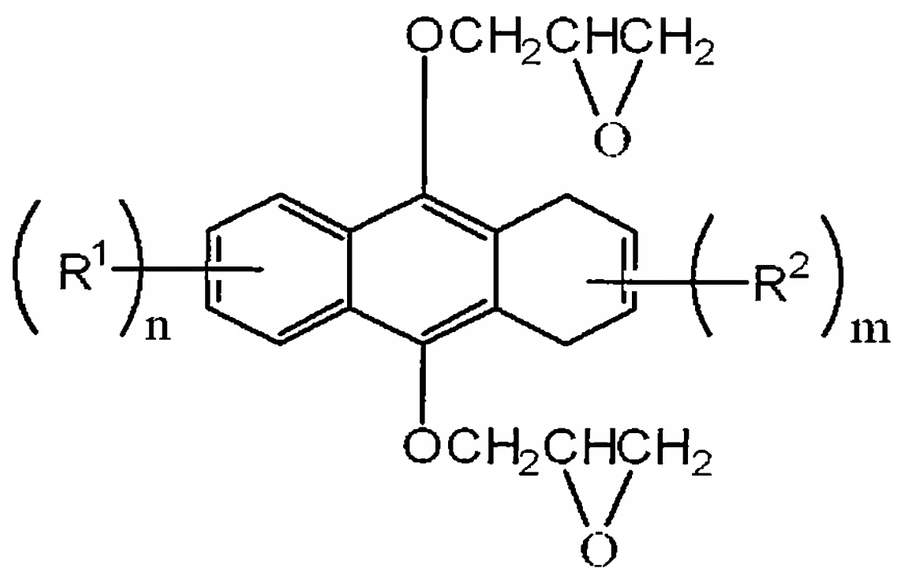
Date: February 10, 2010

Seiichi Akagi

Seiichi AKAGI

APPENDIX (CLAIMS):

1. A sealant epoxy-resin molding material, comprising an epoxy resin (A) and a hardening agent (B), wherein the epoxy resin (A) contains a compound represented by the following General Formula (I):



(I)

,

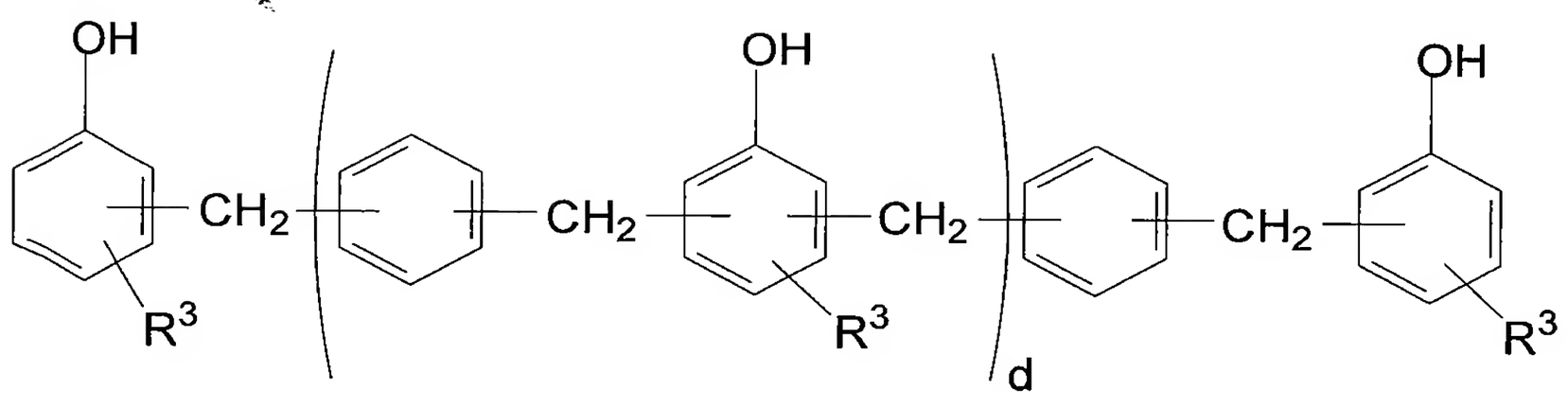
wherein in General Formula (I), R^1 represents a group selected from substituted or unsubstituted hydrocarbon groups having 1 to 12 carbon atoms and substituted or unsubstituted alkoxyl groups having 1 to 12 carbon atoms, and the groups R^1 may be the same as, or different from, each other;

n is an integer of 0 to 4;

R^2 represents a group selected from substituted or unsubstituted hydrocarbon groups having 1 to 12 carbon atoms and substituted or unsubstituted alkoxy groups having 1 to 12 carbon atoms, and the groups R^2 may be the same as, or different from, each other; and

m is an integer of 0 to 6.

2. The sealant epoxy-resin molding material according to Claim 1, wherein the hardening agent (B) contains a compound represented by the following General Formula (II):



(II)

wherein R^3 represents a group selected from a hydrogen atom and substituted or unsubstituted monovalent hydrocarbon groups having 1 to 10 carbon atoms; and

d is an integer of 0 to 10.

3. The sealant epoxy-resin molding material according to Claim 1, further comprising a hardening accelerator (C).

4. The sealant epoxy-resin molding material according to Claim 3, wherein the hardening accelerator (C) is triphenylphosphine.

5. The sealant epoxy-resin molding material according to Claim 3, wherein the hardening accelerator (C) is an adduct of a tertiary phosphine compound and a quinone compound.

6. The sealant epoxy-resin molding material according to Claim 1, further comprising an inorganic filler (D).

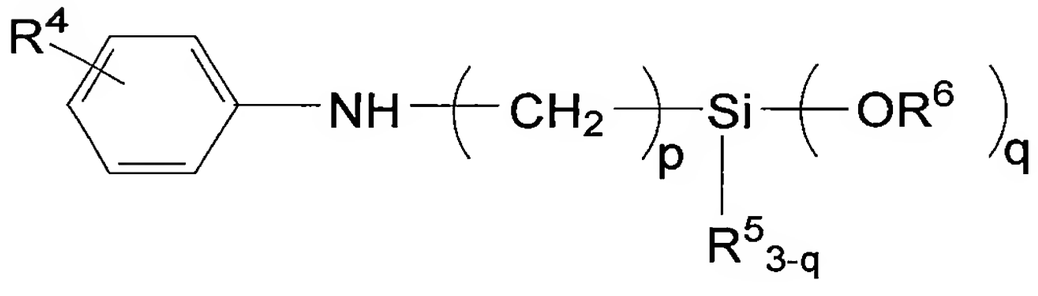
7. The sealant epoxy-resin molding material according to Claim 6, wherein the content of the inorganic filler (D) is 60 to 95 wt % with respect to the sealant epoxy-resin molding material.

8. The sealant epoxy-resin molding material according to Claim 6, wherein the content of the inorganic filler (D) is 70 to 90 wt % with respect to the sealant epoxy-resin molding material.

9. The sealant epoxy-resin molding material according to Claim 1, further comprising a coupling agent (E).

10. The sealant epoxy-resin molding material according to Claim 9, wherein the coupling agent (E) contains a secondary amino group-containing silane-coupling agent.

11. The sealant epoxy-resin molding material according to Claim 10, wherein the secondary amino group-containing silane-coupling agent contains a compound represented by the following General Formula (III):



(III)

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wherein R^4 represents a group selected from a hydrogen atom, alkyl groups having 1 to 6 carbon atoms, and alkoxy group having 1 to 2 carbon atoms;

R^5 represents a group selected from alkyl groups having 1 to 6 carbon atoms and a phenyl group;

R^6 represents a methyl or ethyl group;

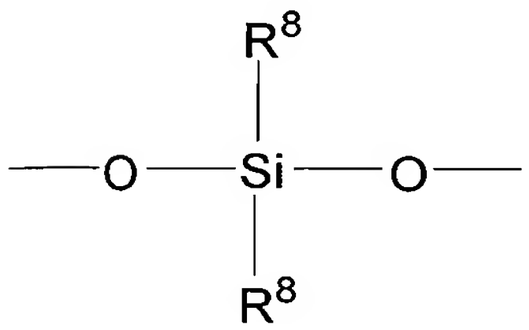
p is an integer of 1 to 6; and

q is an integer of 1 to 3.

12. The sealant epoxy-resin molding material according to Claim 1, wherein the epoxy resin (A) and the hardening agent (B) are melt-mixed previously.

13. (Cancelled)

14. The sealant epoxy-resin molding material according to Claim 27, wherein the silicon-containing polymer (F) has the following bond (e) additionally:



(e)

,

wherein R^8 represents a group selected from substituted or unsubstituted monovalent hydrocarbon groups having 1 to 12 carbon atoms; and

the groups R^8 in the silicon-containing polymer may be the same, as or different from, each other.

15. The sealant epoxy-resin molding material according to Claim 27, wherein the softening temperature of the silicon-containing polymer (F) is 40°C or higher and 120°C or lower.

16. The sealant epoxy-resin molding material according to Claim 27, wherein R^7 in the silicon-containing polymer (F) is at least one of a substituted or unsubstituted phenyl group and a substituted or unsubstituted methyl group.

17. The sealant epoxy-resin molding material according to Claim 27, wherein the rate of substituted or unsubstituted phenyl groups having 1 to 12 carbon atoms in all groups R^7 in the silicon-containing polymer (F) is 60 to 100 mol %.

18. The sealant epoxy-resin molding material according to Claim 1, further comprising at least one of a compound (G) represented by Compositional Formula (XXXXIX) and a compound (H) represented by the following Compositional Formula (XXXXXIX):

$Mg_{1-a}Al_a(OH)_2(CO_3)_{a/2}\cdot kH_2O$ (XXXXIX),

wherein $0 < a \leq 0.5$; and

k is a positive number), and

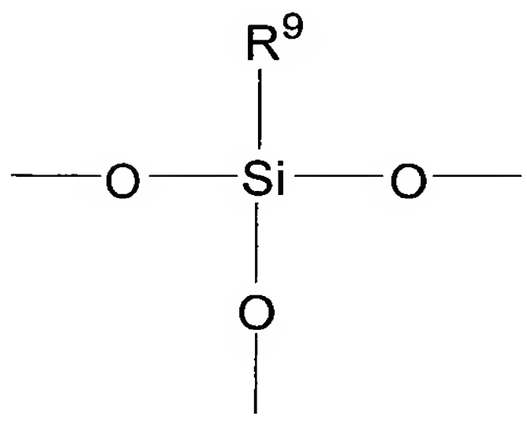
$BiO_b(OH)_y(NO_3)_z$ (XXXXXIX),

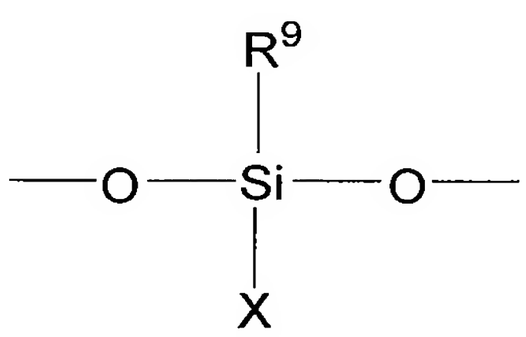
wherein $0.9 \leq b \leq 1.1$, $0.6 \leq y \leq 0.8$, and $0.2 \leq z \leq 0.4$.

19. An electronic component device, comprising an element sealed with the sealant epoxy-resin molding material according to Claim 27.

20. The sealant epoxy-resin molding material according to Claim 6, further comprising a coupling agent (E).

21. The sealant epoxy-resin molding material according to Claim 20, further comprising a silicon-containing polymer (F) having the following bonds (c) and (d),


(c),


(d)

,

a terminal selected from R^9, a hydroxl group and alkoxy groups, and an epoxy equivalence of 500 to 4,000,

wherein R^9 represents a group selected from substituted or unsubstituted monovalent hydrocarbon groups having 1 to 12 carbon atoms;

the groups R^9 in the silicon-containing polymer may be the same as, or different from, each other; and

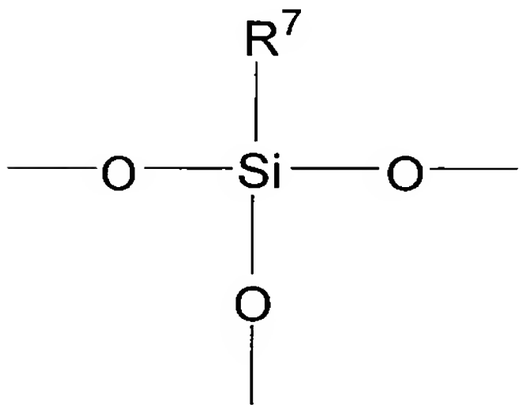
X represents an epoxy group-containing monovalent organic group.

22. The sealant epoxy-resin molding material according to Claim 3, further comprising an inorganic filler (D).

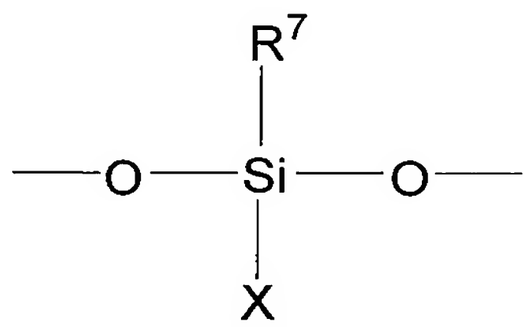
23. The sealant epoxy-resin molding material according to Claim 3, further comprising a coupling agent (E).

24. The sealant epoxy-resin molding material according to Claim 3, wherein the epoxy resin (A) and the hardening agent (B) are melt-mixed previously.

25. The sealant epoxy-resin molding material according to Claim 3, further comprising a silicon-containing polymer (F) having the following bonds (c) and (d),



(c),



(d)

a terminal selected from R^7, a hydroxyl group and alkoxy groups, and an epoxy equivalence of 500 to 4,000,

wherein R^7 represents a group selected from substituted or unsubstituted monovalent hydrocarbon groups having 1 to 12 carbon atoms;

the groups R^7 in the silicon-containing polymer may be the same as or different from each other; and

X represents an epoxy group-containing monovalent organic group.

26. The sealant epoxy-resin molding material according to Claim 3, further comprising at least one of a compound (G) represented by Compositional Formula (XXXXIX) and a compound (H) represented by the following Compositional Formula (XXXXXIX):

$Mg_{1-a}Al_a(OH)_2(CO_3)_{a/2}\cdot kH_2O$ (XXXXIX),

wherein $0 < a \leq 0.5$; and

m is a positive number), and

$BiO_b(OH)_y(NO_3)_z$ (XXXXXIX),

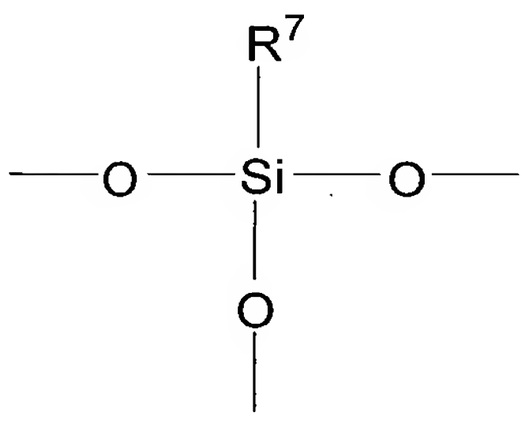
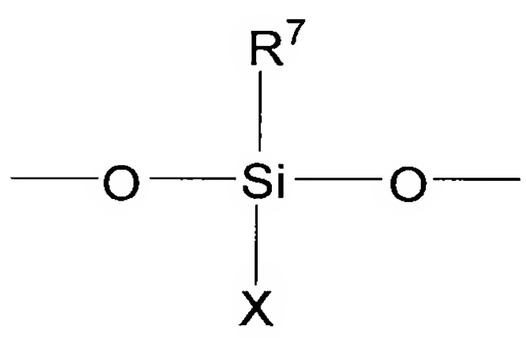
wherein $0.9 \leq b \leq 1.1$, $0.6 \leq y \leq 0.8$, and $0.2 \leq z \leq 0.4$.

27. A sealant epoxy-resin molding material, comprising:

an epoxy resin (A);

a hardening agent (B); and

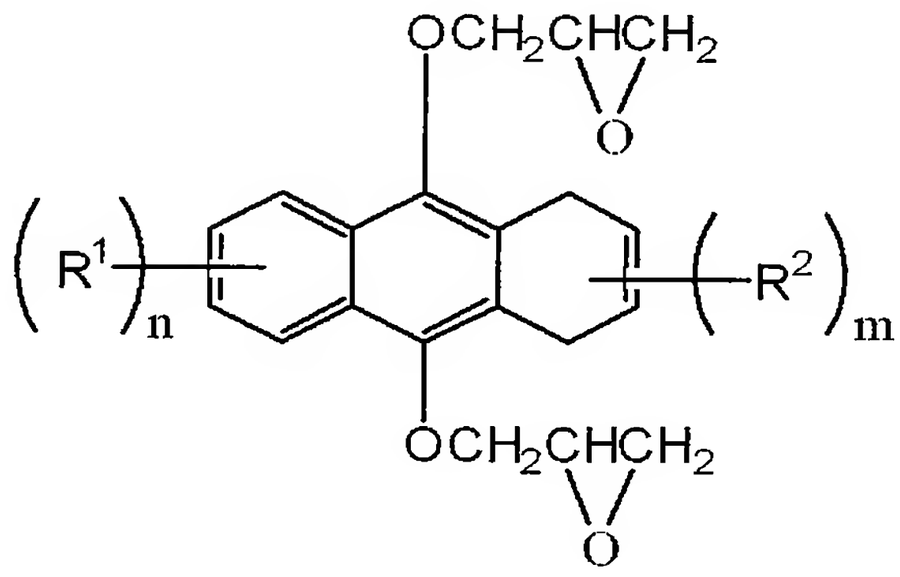
a silicon-containing polymer (F), wherein the silicon-containing polymer (F) has the following bonds (c) and (d),


(c),

(d)

,

a terminal selected from R^7, a hydroxyl group and alkoxy groups, and an epoxy equivalence of 500 to 4,000, wherein R^7 represents a group selected from substituted or unsubstituted monovalent hydrocarbon groups having 1 to 12 carbon atoms, and the groups R^7 in the silicon-containing polymer may be the same as, or different from, each other, and X represents an epoxy group-containing monovalent organic group;

wherein the epoxy resin (A) contains a compound represented by the following General Formula (I),



(I)

,

wherein in General Formula (I), R^1 represents a group selected from substituted or unsubstituted hydrocarbon groups having 1 to 12 carbon atoms and substituted or unsubstituted alkoxyl groups having 1 to 12 carbon atoms, and the groups R^1 may be the same as, or different from, each other;

n is an integer of 0 to 4;

R^2 represents a group selected from substituted or unsubstituted hydrocarbon groups having 1 to 12 carbon atoms and substituted or unsubstituted alkoxy groups having 1 to 12 carbon atoms, and the groups R^2 may be the same as, or different from, each other; and

m is an integer of 0 to 6.